SIEMENS

ACOM.Report® VA02A

[redacted] AX

DICOM Conformance Statement

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1. Introduction

1.1 Overview

The Conformance Statement describes the DICOM interface for the Siemens ACOM.Report® VA02A application in terms of part 2 of [DICOM].

This introduction describes the application's implemented DICOM functionality in general terms.

1.2 Scope and Field

The Siemens product ACOM.Report® is an application to convert report files from the Siemens CathCor® or QuantCor® products or from Microsoft WORD® into the DICOM format. Now the reports can be archived on a DICOM CD and can be viewed from there with any DICOM viewer.
The ACOM.Report® supports the storage of images utilizing the DICOM XA IOD.

1.3 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

1.4 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality as SCU and SCP, respectively.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Siemens and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

The comparison of different conformance statements is the first step towards assessing interconnectivity between Siemens and non-Siemens equipment.

Test procedures should be defined and tests should be performed by the user to validate the connectivity desired. DICOM itself and the conformance parts do not specify this.

The standard will evolve to meet the users' future requirements. Siemens is actively involved in developing the standard further and therefore reserves the right to make changes to its products. Siemens reserves the right to modify the design and specification contained herein without prior notice. Please contact your local Siemens representative for the most recent product information.

1.5 Definitions, Terms and Abbreviations

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Additional Abbreviations are as follows

AE	DICOM Application Entity
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater
O	Optional Key Attribute
R	Required Key Attribute
IOD	DICOM Information Object Definition
PDU	DICOM Protocol Data Unit
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
U	Unique Key Attribute
UID	Unique Identifier
VR	Value Representation

1.6 References

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.13, 1999

2. Network Functionality

The ACOM.Report® DICOM network service implementation acts as SCU for the specified services:

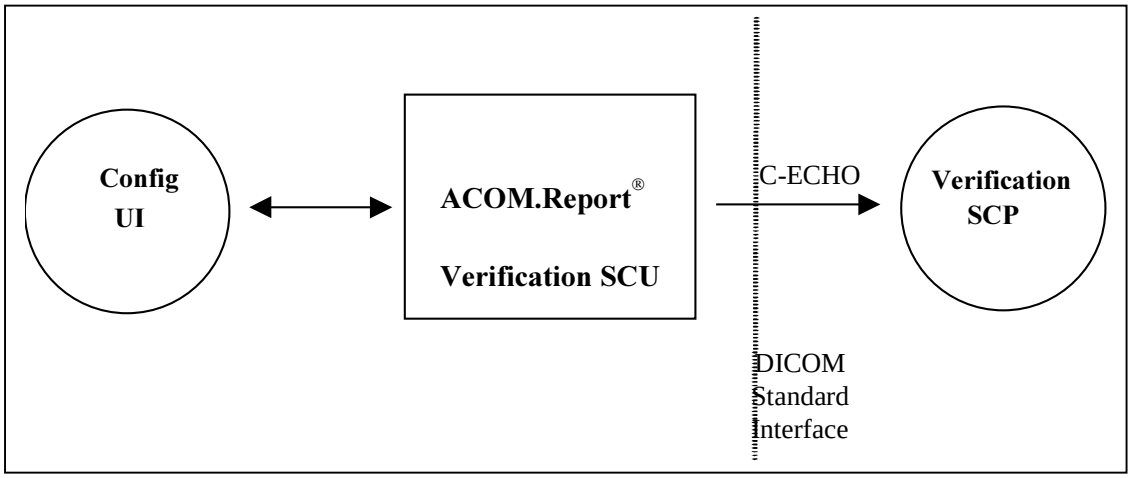
- DICOM Verification (C-ECHO) as SCU
- DICOM Storage (C-STORE) as SCU
- DICOM Query (C-FIND) as SCU

2.1 Verification

The Verification service class defines an application-level class of service which allows for the operator to verify the ability of an application on a remote node to respond to DICOM messages. The DICOM Service Tool application supports the Verification service to act as SCU.

2.1.1 Application Data Flow Diagram

The Siemens DICOM network implementation is a Windows NT application and acts as SCU for the Verification service.



2.1.2 Functional Definition of AE

The ACOM.Report® product supports the DICOM Verification service as SCU. It opens an association to the remote application and sends a Verification request message to verify that the remote application can respond to DICOM messages.

2.1.3 Sequencing of Real World Activities

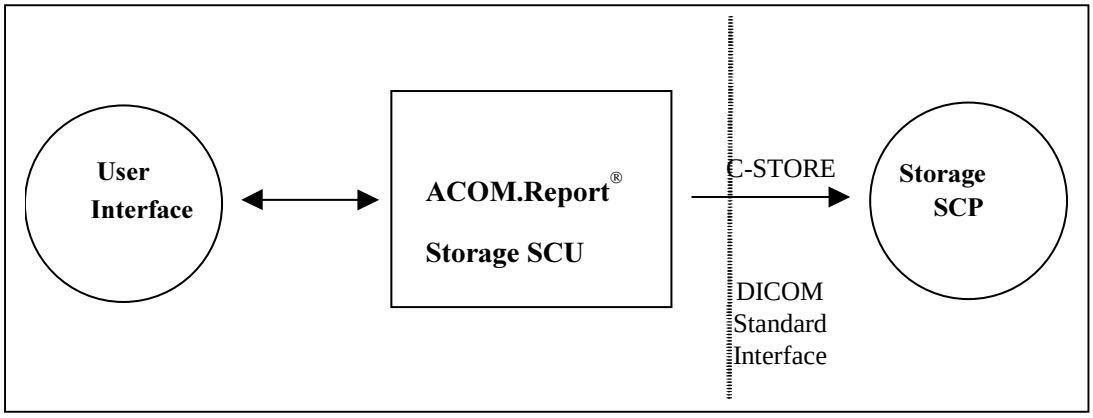
The ACOM.Report® application provides configuration pages to configure the devices and also the data for the remote DICOM nodes. There a button is provided to check for a configured remote DICOM node. When the button is pressed then ACOM.Report will issue a Verification and then a Query Request.

2.2 Storage

The ACOM.Report® application supports the DICOM services
- Send (C-STORE) as SCU

2.2.1 Application Data Flow Diagram

The Siemens DICOM network implementation is a Windows NT application and acts as SCU for the Storage service.



2.2.2 Functional Definition of AE

The ACOM.Report® product supports the DICOM Storage service as SCU. It opens an association to the remote application and sends the selected ACOM.Report images.

2.2.3 Sequencing of Real World Activities

The ACOM.Report® VA02A application provides a User Interface to select the ACOM.Report images and send them to remote DICOM nodes.

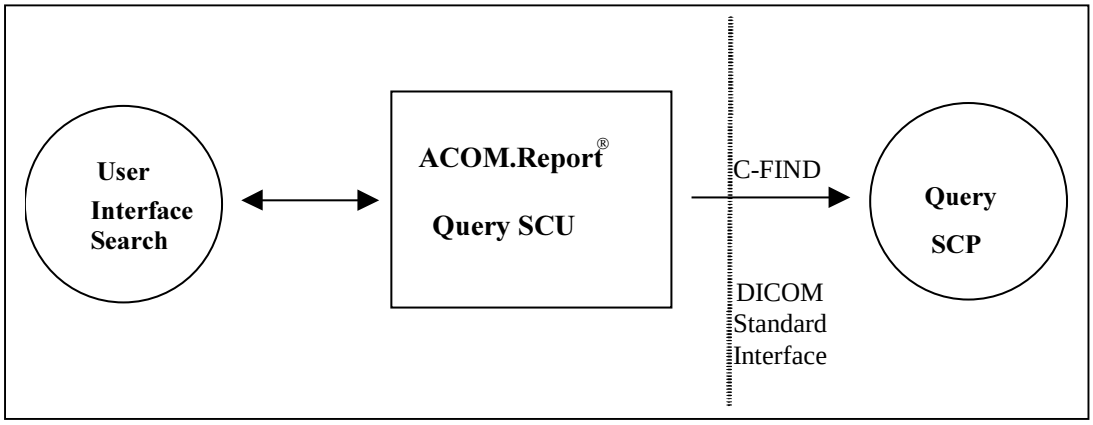
2.3 Query

The ACOM.Report® application supports the DICOM services

- Query (C-FIND) as SCU

2.3.1 Application Data Flow Diagram

The Siemens DICOM network implementation is a Windows NT application and acts as Query SCU to request database information from remote nodes



2.3.2 Functional Definition of AE

The ACOM.Report® product supports the DICOM Query service as SCU. It opens an association to the remote application and queries for database information on Patient/Study and Series level.

2.3.3 Sequencing of Real World Activities

The ACOM.Report® VA02A application provides a User Interface to query a remote node for its patient information (with or without explicit query criteria). This information is then used to complete the image headers of the ACOM.Report images (fill missing Patient and Study data). Afterwards the user can send the ACOM.Report images to other nodes or store onto CD-R.

3. AE Specifications

3.1 Verification AE Specification

3.1.1 Association Establishment Policies – Verification SCU

3.1.1.1 General

The configuration of the ACOM.Report application defines the Application Entity Title.

3.1.1.2 Number of Associations

The Siemens DICOM application initiates one association at a time, one for each Verification request being initiated by the user.

3.1.1.3 Asynchronous Nature

The ACOM.Report software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.1.4 Implementation Identifying Information

Implementation Class UID	“1.3.12.2.1107.5.4.9.40”
Implementation Version Name	“ ACOM_PC_40"

3.1.2 Association Initiation by Real-World Activity - Verification SCU

The ACOM.Report application attempts to initiate a new association for

- DIMSE C-ECHO

service operations.

3.1.2.1 Associated Real-World Activity - Verification SCU

The associated Real-World activity is a C-ECHO request initiated by the DICOM Configuration User Interface of the ACOM.Report application. If the process successfully establishes an association to a remote Application Entity, it will send the C-ECHO-Request via the open association to verify that the remote Application Entity is responding to DICOM messages.

3.1.2.2 Proposed Presentation Contexts - Verification SCU

The Siemens DICOM application will propose Presentation Contexts as shown in the following table

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification Service Class	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.3 SOP Specific Conformance Statement - Verification SCU

The Application conforms to the definition of a Verification SCU in accordance to the DICOM Standard.

3.2 Storage AE Specification

The ACOM.Report® application provides one AE being used when initiating associations to remote DICOM nodes.
SIEMENS ACOM.Report DICOM product provides Standard Conformance to the following DICOM SOP Classes as an SCU:

SOP Class Name	SOP Class UID
XA (X-Ray Angiographic) Image Storage	1.2.840.10008.5.1.4.1.1.12.1

3.2.1 Association Establishment Policies – Storage SCU

3.2.1.1 General

The configuration of the ACOM.Report application defines the Application Entity Title.

3.2.1.2 Number of Associations

The Siemens DICOM application initiates several associations at a time, one per destination for the selected ACOM.Report images of each patient to be transferred.

3.2.1.3 Asynchronous Nature

The ACOM.Report software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.2.1.4 Implementation Identifying Information

Implementation Class UID	“1.3.12.2.1107.5.4.9.40”
Implementation Version Name	“ ACOM_PC_40"

3.2.2 Association Initiation by Real-World Activity - Storage SCU

The ACOM.Report application attempts to initiate a new association for

- DIMSE C-STORE

service operations.

3.2.2.1 Associated Real-World Activity - Storage SCU

The associated Real-World activity is a C-Store request initiated by User Interface of the ACOM.Report application. If the process successfully establishes an association to the remote Application Entity, it will send the selected ACOM.Report images of that patient one after the other via the open association.

If the C-STORE Response from the remote Application contains an error status the transfer is aborted.

3.2.2.2 Proposed Presentation Contexts - Storage SCU

The Siemens DICOM application will propose Presentation Contexts as shown in the following table

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
XA Image Storage Service Class	1.2.840.10008.5.1.4.1.1.12.1	DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

3.2.2.3 SOP Specific Conformance Statement - Storage SCU

The ACOM.Report images will not contain any private attributes (see Annex A: Siemens ACOM.Report® XA IOD Description for detailed header dump)

3.3 Query AE Specification

The ACOM.Report® application provides one AE being used when initiating associations to remote DICOM nodes.
SIEMENS ACOM.Report DICOM product provides Standard Conformance to the following DICOM SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model C-FIND	1.2.840.10008.5.1.4.1.2.2.1

3.3.1 Association Establishment Policies – Query SCU

3.3.1.1 General

The configuration of the ACOM.Report application defines the Application Entity Title.

3.3.1.2 Number of Associations

The Siemens DICOM application initiates several associations at a time.
For Query it initiates a new association to the remote node and issues the C-FIND request to retrieve all the requested patient and study information matching the search criteria. Depending on the search criteria ACOM.Report can initiate in parallel a second association to the destination node to query for all the series information for each study information returned on the first association.

3.3.1.3 Asynchronous Nature

The ACOM.Report software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.3.1.4 Implementation Identifying Information

Implementation Class UID	“1.3.12.2.1107.5.4.9.40”
Implementation Version Name	“ ACOM_PC_40"

3.3.2 Association Initiation by Real-World Activity – Query SCU

The ACOM.Report application attempts to initiate a new association for

- DIMSE C-FIND

service operations.

3.3.2.1 Associated Real-World Activity - Search

The associated Real-World activity is either:

- The user entered specific Search criteria in the user interface and started the Search. In this case ACOM.Report Application establishes an association to the remote Application Entity and sends the query request (C-FIND) for the patient and study information over the open association. In parallel ACOM.Report initiates a second association to the remote Application Entity. This second association is used to automatically query for the series information of each Study returned by the remote AE on the first association. All Patient/Study/Series information is then combined and displayed in the Browsing User Interface of ACOM.Report.
- Or if the Auto-Merge function is enabled in ACOM.Report:
  ACOM.Report will use the data Patient name, ID, date of Birth, Sex, Study ID and Accession number to automatically query one configured node. It opens the association to the remote node and sends the C-FIND query with the corresponding search criteria. If one match is found then the ACOM.Report image is automatically filled with the missing patient and study information and forwarded to the configured destinations (C-Store). If no or more than one match is found no automatic Merge will be done.

If the C-FIND Response from the remote Application contains an error status the query is aborted.

If the remote node returns more results than the maximum number of matches (default is 3000), then ACOM.Report will issue a C-FIND-CANCEL Request. If the remote AE still continues sending results then ACOM.Report will abort the association.

3.3.2.2 Proposed Presentation Contexts – Query SCU

The Siemens DICOM application will propose Presentation Contexts as shown in the following table

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Study Root Query/Retrieve Find	1.2.840.10008.5.1. 4.1.2.2.1	DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian DICOM Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

Note: C-FIND Extended Negotiation will be NOT supported by the SCU.

3.3.2.3 SOP Specific Conformance Statement– Query SCU

The Siemens DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The following tables describe the search keys for the supported query model that the Siemens Query application supports as an SCU:

STUDY LEVEL KEYS FOR THE STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL:
Query Level (0008,0052) = STUDY

Attribute Description	Tag	Type	Matching	user input	return value displayed
Patient's Name	(0010,0010)	R	Wildcard or Universal (Null)	Enter value	yes
Patient ID	(0010,0020)	R	Wildcard or Universal (Null)	Enter value	yes
Patient's Birth Date	(0010,0030)	O	Range or Universal (Null)	Enter value	yes
Patient's Sex	(0010,0040)	O	Wildcard or Universal (Null)	Enter value	yes
Patient Comments	(0010,4000)	O	Universal (Null)	-	yes
Study ID	(0020,0010)	R	Wildcard or Universal (Null)	Enter value	yes
Accession Number	(0008,0050)	R	Wildcard or Universal (Null)	Enter value	yes
Study Date	(0008,0020)	R	Range or Universal (Null)	Range of dates	yes
Study Time	(0008,0030)	R	Universal (Null)	-	yes
Study Instance UID	(0020,000D)	U	Universal (Null)	-	-
Referring Physician's Name	(0008,0090)	O	Universal (Null)	-	yes
Study Description	(0008,1030)	O	Wildcard or Universal (Null)	Enter value	yes

SERIES LEVEL KEYS FOR THE STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL:
Query Level (0008,0052) = SERIES

Attribute Description	Tag	Type	Matching	user input	return value displayed
Modality	(0008,0060)	R	Universal (Null)	-	yes
Series Number	(0020,0011)	R	Universal (Null)	-	-
Series Instance UID	(0020,000E)	U	Universal (Null)	-	-
Performing Physician´s Name	(0008,1050)	O	Wildcard or Universal (Null)	Enter value	yes

Series Date	(0008,0021)	O	Range or Universal (Null)	Range of dates	yes
Series Time	(0008,0031)	O	Universal (Null)	-	yes
Series Description	(0008,103E)	O	Universal (Null)	-	-
Institution Name	(0008,0080)	O	wildcard or Universal (Null)	Enter value	Yes
PerformedProcedureStep ID	(0040,0253)	O	Universal (Null)	-	-
PerformedProcedureStep Start Date	(0040, 0244)	O	Universal (Null)	-	yes
PerformedProcedureStep Start Time	(0040, 0245)	O	Universal (Null)	-	yes
PerformedProcedureStep Description	(0040,0254)	O	Universal (Null)	-	-
From Study level					
Study Instance UID	(0020,000D)	U	Single value	-	-

The following Element will be part in every query request message and always have the fixed value of "ISO_IR 100".

Specific Character Set	(0008,0005)	O	-	-	-

The Search string for the Performing Physicians Name is extended with a wildcard in front and after the entered string to support also the search on second and third physician.

Note: The Search on a DICOM device is Case Sensitive!

Support for:

- DIMSE C-FIND-CANCEL

The ACOM.Report Application does issue a C-FIND-Cancel request if it receives more than the maximum number of matches (default is 3000). If the remote AE still continues sending results then ACOM.Report will abort the association.

The Find SCU interprets following status codes:

Service Status	Further Meaning	Status Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied.	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier.	FF01	Identifier

After ACOM.Report application has received all C-FIND responses with Status ´Success´ then it will close both associations. Same is true after Status ´Cancel´ when ACOM.Report had issues a C-FIND-CANCEL request.

3.4 Communication Profiles

3.4.1 Supported Communication Stacks (part 8)

The DICOM Interface of the ACOM.Report® provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

3.4.2 TCP/IP Stack

The DICOM Interface of the ACOM.Report® uses the TCP/IP stack from the operating system upon which executes. It uses the MergeCOM subroutine library .

3.4.3 Physical Media Support

The DICOM Interface of the ACOM.Report® is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Windows NT operating system upon which it executes.

3.5 Extensions/Specializations/Privatizations

3.5.1 Standard Extended / specialized / Private SOPs

None.

3.5.2 Private Transfer Syntaxes

None.

3.6 Configuration

3.6.1 AE Title/Presentation Address Mapping

The Siemens ACOM.Report® DICOM Application Entity Titles are configurable in the configuration pages.

3.6.2 Configurable Parameters

The Application Entity Titles, Host names and Port numbers of the remote DICOM nodes are configured using the configuration pages.
–

In the configuration User Interface of ACOM.Report a DICOM Test can be performed. If the Test button is pressed then ACOM.Report will issue first a C-ECHO request and if successful also a C-FIND request.

3.6.3 Number of Simultaneous Associations

ACOM.Report® supports multiple associations at a time.

3.6.4 Maximum PDU Size

- max PDU size: 28 kB

3.6.5 Time Out

- time-out until a SCP has to accept/reject an association request: 120 sec
- time-out for responding to an association open/close request : 120 sec
- time-out for a network write to be accepted 120 sec
- time-out for data between TCP/IP packets when receiving a message 120 sec
- time-out for accepting a message over network
  SCU-timeout waiting for Response message 120 sec
  SCP-timeout for waiting for the next message after sending response 120 sec

3.7 Support of Extended Character Sets

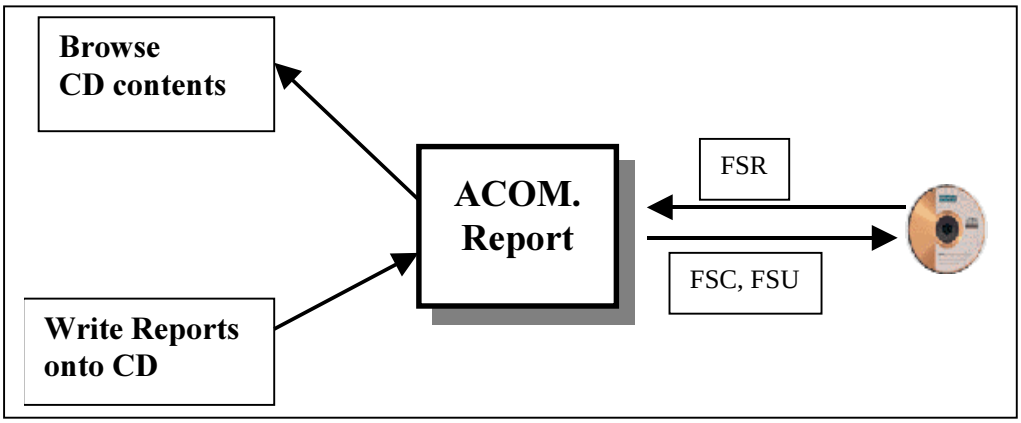
ISO-IR 100 (ISO 8859-1 Latin Alphabet N 1)

4. Media Storage

The ACOM.Report® DICOM off-line media storage service implementation acts as FSC, FSU and FSR for the specified application profiles and the related SOP Class instances.

4.1 Implementation Model

4.1.1 Application Data Flow Diagram



The ACOM.Report® application will serve as an interface to the CD-R off-line medium device. It can load the off-line media directory into the browser and write SOP instances to a medium.

4.1.2 Functional Definition of AE

The ACOM.Report® product DICOM off-line media storage application consists all interfaces to access off-line media. It is capable of

- creating a new File-set onto an unwritten CD-R medium.
- updating an existing File-set by writing new SOP Instances onto the medium.
- reading the File-sets DICOMDIR information temporarily into the browser.

4.1.3 Sequencing of Real World Activities

The ACOM.Report® application will not perform updates before the Directory information of the DICOMDIR is completely read.

4.1.4 File Meta Information Options

Implementation Class UID	“1.3.12.2.1107.5.4.9.40”
Implementation Version Name	“ ACOM_PC_40"

4.2 AE Specification

4.2.1 DICOM Archive Specification

The ACOM.Report® Application provides Standard conformance to Media Storage Service Class (Interchange Option).

Application profiles, Activities, and Roles for DICOM Archive

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD AUG-XABC-CD AUG-XA1K-CD AUG-XABC-DYNAMIC-CD PRI-AREC-CD	Browse Directory Information	FSR	Interchange
	Export to local archive media	FSC,FSU	Interchange

The ACOM.Report® Application can update all three standard Application profiles STD-GEN-CD, STD-XABC-CD (thus creating an AUG-XABC-CD media) and STD-XA1K-CD (thus creating an AUG-XA1K-CD media). When creating a fileset on an empty media (FSC role) then the AUG-XA1K-CD Application Profile will be used.

4.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title is set to the AET of the ACOM.Report application

4.2.1.2 Real-World Activities for this Application Entity

4.2.1.2.1 Real-World Activity: Browse Directory Information

The ACOM.Report® application acts as FSR and reads the DICOMDIR file as soon as a DICOM CD is inserted into the drive. The DICOMDIR contents are evaluated and the Patients listed in the Patient Browser. When a Patient entry is selected in this Patient Browser then the corresponding information about the studies on CD is displayed in the Study Browser. If Detached Patient Management objects are present then the new values from those objects take precedence over the image attributes.

4.2.1.2.2 Real-World Activity: Export to local Archive Media

The ACOM.Report® application acts as an FSU (for media with existing DICOM file-set) or FSC (for not-initialized media) when requested to write Reports to the local archive medium (only CD-R supported).
In case of new media (media not initialized) it will create a DICOMDIR file on the medium or otherwise (already existing DICOM file-set on medium) it will update the existing DICOMDIR file when writing the new Report SOP Instances to medium.
The ACOM.Report® application will not close the CD-R medium.

4.2.1.3 Application profiles

4.2.1.4 DICOMDIR keys

The DICOMDIR file will contain the following attributes for the levels Patient – Study – Series – Image for the new SOP instances written by ACOM.Report® application (valid for all Application profiles described in this chapter) :

DICOMDIR keys:

Attribute Name	Tag	Type	Notes
File-Set Meta information			
File Meta Information Version	(0002,0001)	1	00 01
Media Storage SOP Class UID	(0002,0002)	1	Media Storage Directory SOP Class
Media Storage SOP Instance UID	(0002,0003)	1	
Transfer Syntax UID	(0002,0010)	1	Explicit VR Little Endian
Implementation Class UID	(0002,0012)	1	“1.3.12.2.1107.5.4.9.40”
Implementation Version Name	(0002,0013)	3	“ACOM_PC_40”
Source Application Entity Title	(0002,0016)	3	“ACOM_REPORT_20”
File-Set identification			
File-set ID	(0004,1130)	2	volume label of media
Directory information			
Offset of the First Directory Record of the Root Directory Entry	(0004,1200)	1	
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	
File-set Consistency Flag	(0004,1212)	1	0000H
Directory Record Sequence	(0004,1220)	2	
> Offset of the Next Directory Record	(0004,1400)	1C	
> Record In-use flag	(0004,1410)	1C	FFFFH
> Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1C	
> Directory Record Type	(0004,1430)	1C	PATIENT, STUDY, SERIES, IMAGE
> Referenced File ID	(0004,1500)	1C	contains the filename on media for the Directory Record of Type IMAGE
> Referenced SOP Class UID in File	(0004,1510)	1C	for the Directory Record of Type IMAGE
> Referenced SOP Instance UID in File	(0004,1511)	1C	for the Directory Record of Type IMAGE
> Referenced Transfer Syntax UID in File	(0004,1512)	1C	for the Directory Record of Type IMAGE
> Record Selection Keys	see below		

Patient Keys			**Directory Record Type PATIENT**
Specific Character Set	(0008,0005)	1C	See section 4.5 on page 27
Patient's Name	(0010,0010)	2	
Patient ID	(0010,0020)	1	
Date Of Birth	(0010,0030)	3	Type 2 in STD-XA* profiles
Patient's Sex	(0010,0040)	3	Type 2 in STD-XA* profiles
Study Keys			**Directory Record Type STUDY**
Specific Character Set	(0008,0005)	1C	See section 4.5 on page 27
Study Date	(0008,0020)	1	
Study Time	(0008,0030)	1	
Accession Number	(0008,0050)	2	
Study Description	(0008,1030)	2	
Study Instance UID	(0020,000D)	1C	
Study ID	(0020,0010)	1	
Series Keys			**Directory Record Type SERIES**
Specific Character Set	(0008,0005)	1C	See section 4.5 on page 27
Modality	(0008,0060)	1	
Institution name	(0008,0080)	3	Type 2 in STD-XA* profiles
Institution Address	(0008,0081)	3	Type 2 in STD-XA* profiles
Performing Physician	(0008,1050)	3	Type 2 in STD-XA* profiles
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	1	
Image Keys			**Directory Record Type IMAGE**
Specific Character Set	(0008,0005)	1C	See section 4.5 on page 27
Image Type	(0008,0008)	3	identification characteristics Type 1 in STD-XA* profiles
Frame time	(0018,1063)	3	
Positioner Motion	(0018,1500)	3	
Instance Number	(0020,0013)	1	
Number of Frames	(0028,0008)	3	
Frame Increment Pointer	(0028,0009)	3	(0018,1063)
Calibration Image	(0050,0004)	3	Empty field (Type 2 in STD-XA* profiles, for XA IOD)
Icon Image Sequence	(0088,0200)	3	required for XA Application profiles, optional for the others
> Samples per Pixel	(0028,0002)		1
> Photometric Interpretation	(0028,0004)		MONOCHROME2

> Rows	(0028,0010)		128
> Columns	(0028,0011)		128
> Bits Allocated	(0028,0100)		8
> Bits Stored	(0028,0101)		8
> High Bit	(0028,0102)		7
> Pixel Representation	(0028,0103)		0 (unsigned)
> Pixel Data	(7FE0,0010)		Icon Image pixel data

The Study Date and Study Time (0008,0020 and 0030) in the Study record can be empty if reports are written onto an empty CD without previous merging to an existing study.

4.2.1.5 STD-GEN-CD

For media conforming to the STD-GEN-CD Profile the following SOP classes will be supported as an FSR, FSC,FSU

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Yes	Yes	Yes
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian 1.2.840.10008.1.2.1	No	Yes	No

Detached Patient Management IOD is supported when browsing the media contents.

Standalone IODs (Standalone Overlay, Standalone Curve, ..) are not supported by either FSR/FSC/FSU.

The details of the written XA SOP Instances are described in Annex A.

4.2.2 Augmented and Private Profiles

When updating a Cardio-CD with an already existing file-set then the STD-XABC and STD-XA1K application profiles will be extended to store XA SOP Instances also in uncompressed transfer syntax (and different image matrix format than specified in STD-XABC-CD):

4.2.2.1 AUG-XABC-CD, AUG-XA1K-CD

For media conforming to the AUG-XABC-CD or AUG-XA1K-CD Profile the following SOP classes will be supported as an FSR, FSC,FSU:

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Yes	Yes	Yes
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian 1.2.840.10008.1.2.1	No	Yes	No

Detached Patient Management IOD is supported when browsing the media contents.

The Image matrix format (Rows, Columns) may be any non-square format smaller than or equal 1024x1024. For details see Annex A.

ACOM.Report will use the AUG-XA1k-CD profile when writing reports onto an empty CD.

4.2.2.2 AUG-XABC-DYNAMIC-CD

This profile extends the STD-XABC-CD application profile to store XA SOP Instances also in JPEG lossy transfer syntax. It is used by HICOR®/ACOM® when writing a patient with Dynaview images onto CD-R. ACOM.Report® will be able to update CDs written in this profile but it will not use this profile when storing Reports onto an empty CD.

For media conforming to the AUG-XABC-DYNAMIC-CD Profile the following SOP classes will be supported:

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	Yes	No	Yes
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian 1.2.840.10008.1.2.1	No	Yes	No

Detached Patient Management IOD is supported when browsing the media contents.

4.2.2.3 PRI-AREC-CD

ACOM.Report is capable of updating media that are conforming to the PRI-AREC-CD application profile. Information about this profile is provided with the ACOM.Rec® product SW that creates such media.

4.3 Extensions, Specializations and Privatizations of SOP Classes and Transfer Syntaxes

4.3.1 Standard Extensions of all SOP classes

The following table lists the extensions for all DICOM IOD attributes where the DICOM definitions are extended:

Attribute Name	Tag	Type	Notes
Image Type	(0008,0008)	1	Additional Defined Terms: Defined Terms for value 4: “QCA” “LVA” “LVA BIPLANE” “CURVE” “HEMO” “WORD PORTRAIT” “WORD LANDSCAPE” for description see Annex A Table A.2

The first 3 values for the Image type are always
“ DERIVED\PRIMARY\SINGLE PLANE"

4.4 Configuration

4.4.1 AE Title Mapping

The ACOM.Report® application provides the DICOM Application Entity Title:
" ACOM_REPORT_20"

4.5 Support of Extended Character Sets

ISO-IR 100 (ISO 8859-1:1987 Latin Alphabet N 1. supplementary set)

Annex A: Siemens ACOM.Report® XA IOD Description

Table A.1: XA IOD description for instances created by ACOM.Report® application:

Module	Attribute Name	TAG	Type	Comments
Patient	Patient's Name	0010,0010	2	
	Patient ID	0010,0020	2	
	Patient's Birth Date	0010,0030	2	
	Patient's Sex	0010,0040	2	
General Study	Study Instance UID	0020,000D	1	
	Study Date	0008,0020	2	
	Study Time	0008,0030	2	
	Referring Physician's Name	0008,0090	2	
	Study ID	0020,0010	2	
	Accession Number	0008,0050	2	
	Study Description	0008,1030	3	
General Series	Modality	0008,0060	1	"XA"
	Series Instance UID	0020,000E	1	Always new series
	Series Number	0020,0011	2	Next number
	Series Date	0008,0021	3	
	Series Time	0008,0031	3	
	Performing Physician's Name	0008,1050	3	
	PerformedProcedureStep ID	(0040,0253)	3	
	PerformedProcedureStep Start Date	(0040, 0244)	3	
	PerformedProcedureStep Start Time	(0040, 0245)	3	
	PerformedProcedureStep Description	(0040,0254)	3	
General Equipment	Manufacturer	0008,0070	2	"SIEMENS "
	Institution Name	0008,0080	3	
	Institution Address	0008,0081	3	
	Manufacturer's Model Name	0008,1090	3	"ACOM_REPORT "
	Device Serial Number	0018,1000	3	
	Software Version	0018,1020	3	
General Image	Image Number	0020,0013	2	
	Patient Orientation	0020,0020	2C	Empty field
	Image Date	0008,0023	2C	
	Image Time	0008,0033	2C	
	Lossy Image Compression	0028,2110	1C	"00" for QuantCor LVA, LVA biplane reports "01" for CathCor Hemo, Curve, QuantCor QCA and WORD reports
Image Pixel	Samples per Pixel	0028,0002	1	1
	Photometric Interpretation	0028,0004	1	"MONOCHROME2"
	Rows	0028,0010	1	See Note below
	Columns	0028,0011	1	See Note below
	Bits Allocated	0028,0100	1	8
	Bits Stored	0028,0101	1	8
	High Bit	0028,0102	1	7
	Pixel Representation	0028,0103	1	0000H (unsigned)
	Pixel Data	7FE0, 0010	1	
Cine	Frame Time	0018,1063	1C	"1000" (1sec per frame)
	Recommended Display Frame Rate	0008,2144	3	"1"
Multi-Frame	Number of Frames	0028,0008	1	
	Frame Increment Pointer	0028,0009	1C	00181063H
Frame Pointers	Representative Frame Number	0028,6010	3	"1"
X-Ray Image	Image Type	0008,0008	1	DERIVED\PRIMARY\SINGLE PLANE\... (see section 4.3.1 on page 26)
	Pixel Intensity Relationship	0028,1040	1	"LIN "
X-Ray Acquisition	KVP	0018,0060	2	Empty field
	Radiation Setting	0018,1155	1	"GR"
	Exposure Time	0018,1150	2C	Empty field
	X-Ray Tube Current	0018,1151	2C	Empty field
XA Positioner	Positioner Motion	0018,1500	2C	"STATIC"
	Positioner Primary Angle	0018,1510	2	Empty field
	Positioner Secondary Angle	0018,1511	2	Empty field
VOI LUT	Window Center	0028,1050	3	0..255
	Window Width	0028,1051	1C	1..254

SOP Common	SOP Class UID	0008,0016	1	XA IOD
	SOP Instance UID	0008,0018	1	
	Specific Character Set	0008,0005	1C	"ISO_IR 100"
	Instance Creation Date	0008,0012	3	
	Instance Creation Time	0008,0013	3	
	Instance Creator UID	0008,0014	3	

Note: The resulting image matrix size depends on the Image Type:
Table A.2: ACOM.Report image types

Report Type	Image Type Value 4	Columns	Rows	Comments
Cathcor Curve	CURVE	806	570	Subsampled from original PCL file → Lossy Compression flag 0028,2110 is set to "01"
CathCor Hemo Report	HEMO	612	790	Subsampled from original PCL file → Lossy Compression flag 0028,2110 is set to "01"
QuantCor QCA	QCA	612	866	Subsampled from original format → Lossy Compression flag 0028,2110 is set to "01"
QuantCor LVA	LVA	430	655	Original size
QuantCor LVA biplane	LVA BIPLANE	430	655	Original size
WORD document	WORD PORTRAIT	1024	792	For WORD document pages in portrait format Printed and Subsampled from original WORD file → Lossy Compression flag 0028,2110 is set to "01"
	WORD LANDSCAPE	792	1024	For WORD document pages in landscape format Printed and Subsampled from original WORD file → Lossy Compression flag 0028,2110 is set to "01"